

Claims

1. Method for automatic roaming between heterogeneous WLANs and/or GSM/GPRS/UMTS networks, in which method, for authentication, via a wireless interface within a basic service area of a WLAN, a mobile IP node (20) requests access to the WLAN at an access point (21/ 22), the basic service area of the WLAN including one or more access points (21/22) assigned to an access server (23), in which method, upon request from the access server (23), the mobile IP node (20) transmits an IMSI stored on a SIM card (201) of the mobile IP node (20) to the access server (23), and the IMSI of the IP node (20) is stored in a database (31) of a SIM-RADIUS module (30), characterized

in that, based on the IMSI, the logic IP data channel of the WLAN is user-specifically supplemented towards corresponding GSM data for signal and data channels of a GSM network by means of information stored in an SIM user database (34),

in that by means of a SIM gateway module (32), to perform the authentication of the IP node (20), the necessary SS7/MAP functions are generated based on the GSM data,

in that, by means of a SIM user database (34) and SIM gateway module (32), the SIM-RADIUS module (30) performs the authentication of the mobile IP node (20) at a HLR (37) and/or VLR (37) of a GSM network, based on the IMSI of the SIM card (201) of the mobile node (20), and

in that with successful authentication a location update is performed at the HLR (37) and/or VLR (37), and the mobile IP node (20) receives a corresponding entry in a customer database of the access server (23), the WLAN being released for use by the mobile IP node (20).

2. Method for automatic roaming between heterogeneous WLANs and/or GSM/GPRS/UMTS networks according to claim 1, characterized in that, with successful authentication, in addition to the location update at the HLR (37) and/or VLR (37), an authorization of the mobile IP node (20) is performed,

a corresponding user profile based on the IMSI being downloaded at the HLR (37) and/or VLR (37).

3. Method for automatic roaming between heterogeneous WLANs and/or GSM/GPRS/UMTS networks according to one of the claims 1 or 2,
5 characterized in that, for the authentication of the mobile IP node (20), the IMSI stored on the SIM card of the mobile IP node (20) is only used up to one or more of the first authentication stages and that for all further authentication stages the IMSI is replaced by a generated temporary IMSI.

4. Method for automatic roaming between heterogeneous WLANs
10 and/or GSM/GPRS/UMTS networks according to one of the claims 1 to 3, characterized in that the authentication of the mobile IP node (20) is performed by means of an extensible authentication protocol.

5. Method for automatic roaming between heterogeneous WLANs and/or GSM/GPRS/UMTS networks according to one of the claims 1 to 4,
15 characterized in that the data stream of the mobile IP node (20) is directed via a mobile radio network service provider during access to the WLAN from the access point (21/22).

6. Method for automatic roaming between heterogeneous WLANs and/or GSM/GPRS/UMTS networks according to claim 5, characterized in that,
20 based on the authentication by means of the IMSI, the mobile radio network service provider issues the corresponding service authorization for use of different services and/or performs the billing of the service availed of.

7. Method for automatic roaming between heterogeneous WLANs and/or GSM/GPRS/UMTS networks according to one of the claims 1 to 6,
25 characterized in that the SIM user database (34) is connected to a sync module (35) and a sync database (36) for changing or deleting existing user datasets or for inserting new user datasets, the comparison of the databases (34/36) being carried out periodically and/or initiated by changes in the sync database (36) or through failure of the SIM user database (34).

8. Method for automatic roaming between heterogeneous WLANs and/or GSM/GPRS/UMTS networks according to one of the claims 1 to 7, characterized in that, by means of a clearing module 533 for the billing, the billing records of the heterogeneous WLANs are synchronized with the user data and processed based on the GSM-Standard TAP.

9. System for automatic roaming between heterogeneous WLANs and/or GSM/GPRS/UMTS networks, which system includes at least one WLAN, with a basic service area in each case, which basic service area of a WLAN includes one or more access points (21/22) assigned to an access server (23), which access points (21/22) include a wireless interface (211) for communication with mobile IP nodes (20) and which mobile IP nodes (20) include an SIM card (201) for storage of an IMSI, characterized,

in that the access server (23) includes an SIM-RADIUS module (30) with a database (31) for storage of the IMSI, based on the IMSI and by means of information stored in an SIM user database (34), the logical IP data channel of the WLAN being supplemented user-specifically towards GSM data for signal and data channels of a GSM network,

in that the system includes an SIM gateway module (32), by means of which to perform the authentication of the mobile IP node (20) the necessary SS7/ MAP functions are able to be generated based on the GSM data, and

in that the access server (23) includes a customer database, in which authenticated users of the WLAN can be entered by means of the SIM-RADIUS module (30), during the entry a location update of the IMSI of the mobile IP node (20) being performed at the HLR (37) and/or VLR (37).

10. System for automatic roaming between heterogeneous WLANs and/or GSM/GPRS/UMTS networks according to claim 9, characterized in that, with successful authentication, in addition to the location update by means of a user profile of the HLR (37) and/or VLR (37) an authorization of the mobile IP node (20) can be performed.

11. System for automatic roaming between heterogeneous WLANs and/or GSM/GPRS/UMTS networks according to one of the claims 9 or 10, characterized in that, for the authentication of the mobile IP node (20), the IMSI is replaceable in at least one of the authentication stages by a temporary IMSI
5 generated by means of a module.

12. System for automatic roaming between heterogeneous WLANs and/or GSM/GPRS/UMTS networks according to one of the claims 9 to 11, characterized in that the authentication of the mobile IP node (20) can be performed by means of the Extensible Authentication Protocol.

10 13. System for automatic roaming between heterogeneous WLANs and/or GSM/GPRS/UMTS networks according to one of the claims 9 or 12, characterized in that the system includes of a mobile radio network provider via whom the data stream of the mobile IP node (20) is able to be rerouted from the access point (21/22) during access to the WLAN.

15 14. System for automatic roaming between heterogeneous WLANs and/or GSM/GPRS/UMTS networks according to claim 13, characterized in that the mobile radio network provider includes a authorization module, which, based on the authentication by means of the IMSI, issues the corresponding service authorization for use of different services, and/or includes a clearing
20 system (53) that carries out the billing for the service availed of.

15. System for automatic roaming between heterogeneous WLANs and/or GSM/GPRS/UMTS networks according to one of the claims 9 to 14, characterized in that the system includes a sync module (35) with a sync database (36), by means of which the SIM user database (34) is connected for
25 changing or deleting existing user datasets or for inserting new user datasets, the comparison of the databases being carried out periodically and/or initiated by changes in the sync database (36) and/or through failure of the SIM user database (34).

16. System for automatic roaming between heterogeneous WLANs
30 and/or GSM/GPRS/UMTS networks according to one of the claims 9 to 15,

characterized in that, by means of a clearing module 533 for the billing, the billing records of the heterogeneous WLANs are able to be synchronized with the user data and are able to be processed based on the GSM standard TAP.